

Environmental Assessment

Conservation Measures to Restore Flow
to Chewacla Creek
downstream of Lake Ogletree Dam

In
Auburn, Lee County, Alabama

November 2003

Prepared by:
U.S. Fish and Wildlife Service
Southeast Region

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EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service has received an application for an Endangered Species Act Section 10(a)(1)(A) Enhancement of Survival Permit (ESP) in conjunction with the proposed Chewacla Creek Safe Harbor Agreement (SHA). The Applicants propose to implement conservation measures for benefit of the endangered ovate clubshell mussel (*Pleurobema perovatum*) and southern clubshell mussel (*Pleurobema decisum*), and the threatened fine-lined pocketbook mussel (*Lampsilis altilis*), by repairing subsidence features in and restoring a minimum flow to Chewacla Creek at the base of Lake Ogletree Dam in Auburn, Lee County, Alabama. The ESP is sought to comply with the requirements of section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (Act). If issued, the ESP would authorize the incidental take of the three freshwater mussel species above each landowners' existing baseline. This Environmental Assessment (EA) has been prepared by the Service to comply with provisions of the National Environmental Policy Act of 1969 (NEPA). The Executive Summary is designed to present the information found in the EA.

The Applicants have submitted a SHA, as required by the Act, for this project. The project involves the repair of subsidence features and restoration of flow to a section of Chewacla Creek downstream of Lake Ogletree Dam. The creek, downstream of the base of Lake Ogletree dam, lies within habitat that is considered suitable for the three mussel species. However, on the basis of observations by the Service and others, the apparent suitability, the lack of continuous flow of the creek, and a survey performed by the Applicants' consultant, we presume that the ovate clubshell and southern clubshell no longer exist in this portion of the creek and individual specimens of the fine-lined pocketbook mussel are rare.

The Service's goals in evaluating this application are: (1) to assure that the take and associated impacts would not appreciably reduce the likelihood of species survival and recovery in the wild, and (2) to ensure compliance with the Act, including sections 7, 9, and 10, as well as NEPA and other Federal laws. Additionally, the Service will consider at a minimum: (1) whether the conservation measures outlined in the SHA will provide a net conservation benefit to the species, (2) whether the activity would have significant impacts on other physical or biological resources, (3) whether the activity would have significant impact on the human environment, (4) whether cumulative impacts are significant, and (5) whether additional measures should be incorporated as conditions in the ESP. After considering the information in this EA, together with the Applicants' SHA, the Service has prepared a Finding of No Significant Impact (FONSI) for the Federal action of issuance of the requested ESP.

The EA contains an analysis of five alternatives, including: (1) a no action alternative; (2) repair subsidence features only; (3) supply quarry water to Lake Ogletree only; (4) repair subsidence features and supply quarry water to Chewacla Creek downstream of the Lake Ogletree Dam; and

(5) the Applicants' proposed restoration plan.

Project effects are considered in the EA in terms of onsite direct and indirect impacts, and cumulative effects. The impact to the three mussels and their habitat is the focal point of this analysis, but information on the project's impacts to the overall human environment have also been included.

The action area within which the individual and cumulative impacts of the proposed activities are assessed is that portion of Chewacla Creek extending downstream from the base of Lake Ogletree Dam to its confluence with Parkerson Mill Creek.

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The applicants are seeking Enhancement of Survival Permits (ESP) from the Service in accordance with the requirements of section 10(a)(1)(A) of the Endangered Species Act (Act). They propose to perform several conservation measures which will restore flow to a dewatered section of Chewacla Creek downstream of the Lake Ogletree dam, in Auburn, Lee County, Alabama. The restored flow will benefit three listed species. The ESP would authorize the taking of three species of listed mussels above the pre-development baseline for each property owner. The taking would be incidental to otherwise legal activities (e.g., repair of subsidence features and restoration of creek flow).

The Applicants have submitted a Safe Harbor Agreement (SHA), as required by the Act, for this project. The SHA is provided as **Appendix A** of this EA. The project involves the repair of subsidence features and restoration of flow to a section of Chewacla Creek downstream of Lake Ogletree Dam. (In some areas, the creek is sinking due to the underlying geology and the water is effectively being drained from the creek bed.) The creek, downstream of the base of Lake Ogletree dam, lies within habitat that is considered suitable for the three mussel species. However, on the basis of observations by the Service and others, the lack of continuous flow of the creek, and a survey performed by the Applicants' consultant, we presume that the ovate clubshell and southern clubshell no longer exist in this portion of the creek and individual specimens of the fine-lined pocketbook mussel are rare.

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to allow the applicants to implement conservation measures for the benefit of the fine-lined pocketbook, southern clubshell, and ovate clubshell, by controlling and repairing subsidence features and providing constant minimum flows on the enrolled properties. We expect these actions to result in expansion of the habitat available to the covered species in this reach of Chewacla Creek, and enhancement of the creek's ability to

support cover species populations. An ESP will be issued, which will authorize the Landowners and Cooperators to implement the conservation actions and other provisions of the SHA and authorize the incidental take of the covered species and habitat above each Landowner's baseline responsibilities, as defined in this EA and the SHA. Issuance of such an authorization must be accomplished within the statutory framework identified in sections 7, 9, and 10 of the Act and associated implementing regulations (50 Code of Federal Regulations (CFR) Parts 13 & 17). The terms and objectives of the SHA are consistent with the Service's Recovery Plan for the Mobile River Basin Aquatic Ecosystem (Service 2000) and further the recovery objectives contained therein for the covered species.

1.3 Need for the Proposed Action

The subsidence features in and immediately adjacent to the Chewacla Creek act to funnel water into the ground causing a portion of the creek to become intermittent (dewatered) during most of the year. The lack of constant stream flow in the dewatered section of Chewacla Creek, downstream of the Pretty Hole to Martin Marietta's outfall 2, has made that section of the creek habitat unavailable to the ovate clubshell, southern clubshell and fine-lined pocketbook. It has also physically and genetically isolated the population of fine-lined pocketbook mussel which occurs upstream of the de-watered section. The proposed conservation measures, repair of subsidence features located within and immediately adjacent to the creek and restoration of a consistent stream flow, would increase the quantity and quality of available habitat for the covered species. Without the proposed SHA and ESP, it would likely not be possible for the applicants to undertake the proposed conservation measures and receive protection from Act's section 9 take regulations.

1.4 Decisions That Must be Made

The Service must review the submitted materials, comments, and documents, review the impacts and benefits of the proposed activities and determine whether to issue or deny the ESPs. If the ESP evaluation criteria contained in section 10 (a)(1)(A) of the Act are satisfied, the Service is required to issue the ESP. Within these guidelines the Service may decide to issue a permit conditioned on implementation of the SHA submitted together with other measures specified by the Service. If the issuance criteria for the Act are not satisfied, the Service is required to deny the permit request.

1.5 Issues and Concerns

The primary issues and concerns associated with the application which have been identified by the Service during initial scoping are listed below:

- Is the proposed take incidental to an otherwise lawful activity?
- Does the SHA provide adequate conservation benefits to the covered species?

- Does the SHA provide a detailed baseline for each enrolled property?
- Will the issuance of the ESP increase the likelihood of survival or recovery of the covered species in the wild?
- Have the applicants provided adequate management, monitoring, and funding to implement the conservation measures proposed in the SHA, and cover any unforeseen circumstances?
- Have all appropriate measures been incorporated into the ESP?
- Would the proposed issuance of the ESP have significant impacts on other physical or biological resources in the project area?
- Would the proposed issuance of the ESP have significant impacts on the human environment?

1.6 Coordination and Consultation

The Service has reviewed the significant factors outlined in the President's Council of Environmental Quality (CEQ) Implementing Regulations for compliance with the NEPA. During that review it was determined that there would be no project related impacts to prime farmlands, parklands, wild or scenic rivers, or Federal buildings or lands. In addition no energy or mineral resources would be affected, nor would any toxic substances be produced or released. None of the alternatives would impact compliance with the National Ambient Air Quality Standards.

A Cultural Resource Assessment of the property was carried out by a Service archaeologist. The Alabama Historical Commission was furnished the results of this assessment, with a request for concurrence that there are no cultural or historical resources on the property listed on or eligible for the National Register of Historic Places. Their concurrence letter is included as **Appendix B**. A U.S. Army Corps of Engineers Nationwide Permit 27, #ALJ01-03342-K, (**Appendix C**) was issued to Martin Marietta Aggregates on October 2, 2001, authorizing them to conduct stream restoration to restore flow in Chewacla Creek. Martin Marietta has applied for, and received a National Pollutant Discharge Elimination System (NPDES) Permit to discharge water from the existing pipeline into Lake Ogletree. The permit is included as **Appendix D**.

A Notice of Availability was published in the Federal Register on April 9, 2003, requesting public comment on the proposed project. Two requests were received for additional information and two respondents supplied comments. Copies of the comment letters and the Service's response are in **Appendices E-H**. One commentor was concerned with a provision in the NPDES permit requiring an emergency discharge in Chewacla Creek, which could adversely

affect the baseline population of mussels immediately downstream of the Lake Ogletree dam. We responded that this was a valid concern; however, the SHA does not allow take of the baseline population of mussels and should this emergency outfall be used, the applicants would be subject to section 9 penalties if take resulted.

The other commentor was concerned that a Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP) should be used rather than the proposed SHA and ESP. We responded that since we had concluded no take had yet occurred, and no take was allowed for the baseline population of mussels already located within the action area, we believed a SHA and ESP was the appropriate regulatory tool. This commentor was also concerned that the SHA was developed in response to the settlement of a lawsuit. We responded that the Service was not a party to the lawsuit nor bound to any action described in the lawsuits' settlement agreement. We also pointed out that a settlement agreement, by its very nature, is a voluntary action.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section of the EA describes the alternatives the Service analyzed. The alternatives are summarized below and their anticipated impacts are described in more detail in Section 4. As required by CEQ's Implementing Regulations for NEPA, a no action alternative is included in the analysis to act as a baseline from which impacts and benefits from the various alternatives are assessed.

2.1 Alternative 1, No Action

Under Alternative 1, the Service would not issue an ESP. The subsidence features in Chewacla Creek would not be repaired. Martin Marietta would continue to use outfalls one and two to release quarry water. Water would not be pumped upstream into Lake Ogletree to sustain a minimum flow in Chewacla Creek and only minimal flows would persist immediately downstream of the dam and no flow would be found in the dewatered section. The population of fine-lined pocketbook mussels located immediately downstream of the dam would continue to be isolated. No benefits would be obtained for the other two listed mussel species in Chewacla Creek.

2.2 Alternative 2, Repair Subsidence Features Only

In this alternative, the applicants would repair subsidence features located in and within ten (10) feet of Chewacla Creeks banks within the enrolled property boundaries. These repairs would be the same as with the proposed action, but the applicants would not pump water from the quarry upstream into Lake Ogletree to support a consistent flow in Chewacla Creek. This option could likely restore flow in the dewatered section, but would do little to benefit the listed mussels. However, this flow is likely to not be of sufficient quantity to support the expansion of the covered species from more intact portions of Chewacla Creek.

2.3 Alternative 3, Pump Quarry Water Upstream into Lake Ogletree Only

In this alternative, the applicants would pump quarry water upstream into Lake Ogletree with a guaranteed minimum flow of 2.0 MGD in Chewacla Creek at the base of the Lake Ogletree dam, however subsidence features in the dewatered section would not be repaired. While a portion of the minimum release may make it through the dewatered section, a majority of the water would be lost into the subsidence features. The increased flow would benefit the fine-lined pocketbook mussels located immediately downstream of the dam, but little or no benefit would be gained for the three mussel species in the dewatered section.

2.4 Alternative 4, Repair Subsidence Features and Pump Quarry Water into Chewacla Creek Downstream of the Lake Ogletree Dam

Alternative 4 would require the applicants to return all of the water pumped from the quarry pits into Chewacla Creek downstream of the Lake Ogletree dam. This alternative would increase the volume of flow in Chewacla Creek, likely benefitting the three listed mussels. This alternative, however, is not preferred for one important reason. Given the voluntary nature of the Safe Harbor Agreement, it is necessary to provide the Water Board with access to additional water in order to secure their participation in the Agreement. Without a guaranteed minimum flow level, it was not anticipated that a commitment by all of the Landowners and Cooperators to pursue the SHA would have occurred.

2.5 Alternative 5, The Proposed Action (Repair Subsidence Features and Pump Quarry Water into Lake Ogletree with a Minimum Guaranteed Flow Released into Chewacla Creek)

Alternative 5 is the proposed action. This alternative would require the applicants to repair subsidence features in Chewacla Creek and within ten (10) feet of its banks. It would also require the applicants to pump quarry water upstream into Lake Ogletree. The Water Board would guarantee to release a minimum of two million gallons per day (2.0 MGD) into Chewacla Creek at the base of the Lake Ogletree dam. The minimum flow more closely resembles the documented natural flow conditions in Chewacla Creek and will provide reliable flows and reestablish more natural stream habitat conditions as currently exists in lower sections of the Creek - allowing for the natural expansion of the covered species into this newly-created habitat. The Water Board can use any water in excess of 2.0 MGD pumped from the quarry to supplement their water supply, thereby benefitting the residents of the City of Auburn and assuring the inclusion of the City and the Water Board as participants in the SHA.

3.0 AFFECTED ENVIRONMENT

3.1 Physical Environment

Several physical environment parameters may be affected by the project alternatives. Changes to surface water flow will be positively affected by all alternatives except the no action alternative. Temporary and localized disturbances to soils on the Harris property would result from the alternatives which include the installation of the new pipeline segment. A description of Chewacla Creek, along with pertinent background information, is provided below.

Chewacla Creek and the enrolled properties lie within the Piedmont ecoregion, a transitional area between the Appalachian mountains to the northeast and the relatively flat coastal plain to the south and southeast (Webber and Blevins, 2000). Chewacla Creek flows over three geologic formations, including the Manchester Schist, the Chewacla Marble, and the Hollis Quartzite (Buss 2001).

Chewacla Creek's headwaters originate south of Opelika, Alabama. The creek flows through pasture, commercial, and private developments before emptying into Lake Ogletree, the primary drinking water source for Auburn, Alabama, residents. Lake Ogletree was designed in the 1940s. The elevation of the dam's concrete spillway is 481.5 feet above mean sea level (msl); however, since 1991, boards have been added to the top of the spillway to augment its water retention capacity during the wet spring months, raising the spillway elevation to 486 feet msl.

Historically, Lake Ogletree has not discharged a continuous flow into Chewacla Creek (Buss, 2001), and lack of stream flow within the enrolled properties has been well-documented (Webber and Blevins, 2000; Buss, 2001). Based on data reported by the Geologic Survey of Alabama (GSA), the historical low flow for Chewacla Creek upstream of the Moore's Mill Creek confluence and downstream of Lake Ogletree is a "7Q₂" of 1.8 MGD and a "7Q₁₀" of 0.5 MGD. The term "7Q₁₀" is defined as the lowest seven-day average flow expected to occur once in ten years. The term "7Q₂" is defined as the lowest seven-day average flow expected to occur once every two years. This means that flows can be expected to recede to or below 1.8 MGD in one of every two years (e.g., the 7Q₂ value) and to or below 0.5 MGD in one of every ten years (e.g., the 7Q₁₀ value) (GSA, 1972). The base period for these low flow data was 1939-1962 (Chandler, 2001), therefore spanning before and after the construction of Lake Ogletree Dam. Flow at a site upstream of the Moore's Mill Creek confluence was measured as low as 0.6 MGD by GSA on September 9, 1968, after the construction of Lake Ogletree (GSA, 1972). At this same station, the U.S. Geologic Survey has reported a "7Q₂" of 1.74 MGD and a "7Q₁₀" of 0.32 MGD (converted from 2.7 cubic feet per second (ft³/sec) and 0.5 ft³/sec, as reported, respectively) (USGS, 1994). GSA has estimated that 0.4 MGD is the natural "7Q₁₀" for Chewacla Creek downstream of Lake Ogletree (GSA, 2002).

Immediately downstream of Lake Ogletree dam, current flow conditions in Chewacla Creek can be characterized as generally low to extremely low, with higher flows following significant rainfall events. Webber and Blevins (2000) reported a discharge and velocity too low to read at a station approximately 1,800 feet downstream of Lake Ogletree dam during the fall of 1999. In April of 2000, Buss (2001) measured a flow of 2.55 MGD at approximately the same location, about two weeks after a 1.3-inch rain event, but encountered flow too low to measure a few

weeks later in May at the same location. Water quality downstream of Lake Ogletree is extremely variable and influenced by many different sources. The lack of sufficient flow during most of the year has resulted in a build-up of organic matter, low pH, and the formation of large algal mats in Chewacla Creek between lake Ogletree to the area locally known as “Pretty Hole” (Richardson, 2001).

From the base of Lake Ogletree downstream to the Pretty Hole, Chewacla Creek is a “gaining stream,” meaning that over this reach of the creek flow is increased by groundwater recharge, surface run-off, and tributary inflow (Buss, 2001). Webber (2001) reported data for May 2001 demonstrating that when the flow just downstream of the dam was 2.01 MGD, the flow upstream of the Pretty Hole was 4.87 MGD and, later that month, when the flow downstream of the dam was 0.57 MGD, the flow just upstream of the Pretty Hole was 1.39 MGD. Several tributaries enter Chewacla Creek upstream of Pretty Hole and provide a consistent contribution to the flow of Chewacla Creek upstream of the Pretty Hole.

Just downstream of the Pretty Hole, flow in Chewacla Creek is affected by the presence of subsidence features. These subsidence features are concentrated in and around an area where Chewacla Creek flows over the Chewacla Marble and can be characterized as depressions, sinkholes, solution fractures, or other holes in the underlying substrate that allow surface water loss from the Creek. Extending downstream from the Pretty Hole to outfall 2 of Martin Marietta’s NPDES-permitted discharge, Chewacla Creek does not maintain a year-round flow, and is more accurately characterized at the present time as an intermittent or ephemeral stream. For example, data recently reported by Webber (2001) demonstrated that on May 18, 2001, flow was 1.39 MGD just upstream of the Pretty Hole, but was diminished to 0.13 MGD just downstream of the Pretty Hole.

Consistent flow is restored to Chewacla Creek once the creek reaches outfall 2 of Martin Marietta’s NPDES-permitted discharge. Martin Marietta discharges water from the Quarry pits into Chewacla Creek from two permitted discharge points. Outfall 2 discharges water pumped from the old (East) Quarry pit at a rate ranging from approximately 5.0 to 9.0 MGD. Immediately downstream from outfall 2, the streambed is covered by fine sediments, affecting the abundance and variety of aquatic species utilizing this area. Outfall 1 discharges water pumped from the new (West) Quarry pit at a discharge rate of less than 1.0 MGD (generally around 0.23 MGD) (Martin Marietta, 2000). From outfall 2 downstream to its confluence with Moore’s Mill Creek, Chewacla Creek maintains a consistent flow which is, because of the Quarry’s discharges, artificially elevated above the historical low flows in that reach of the Creek, as demonstrated by the GSA data based on periods before and after the construction of Lake Ogletree discussed above.

Moore’s Mill and Parkerson Mill Creeks both contribute large amounts of sediment, increasing turbidity, from the City of Auburn draining into Chewacla Creek downstream of the quarry (Webber and Blevins, 2000; Jones, 2001). Jones (2001) documented, through sediment sampling, that Moore’s Mill Creek is the primary cause of sedimentation in Chewacla Creek

downstream of their confluence. The ADEM has listed Moore's Mill Creek from its mouth at Chewacla Creek to its source as impaired due to sedimentation (ADEM, 2002).

3.2 Land Use

The properties covered by the SHA are located in Lee County, Alabama, within Township 18 North, Range 25 East, Sections 13 & 24; and Township 18 North, Range 26 East, Sections 16, 17, & 18. Included in each enrolled property, for the purposes of the baseline descriptions, is the bed and banks of Chewacla Creek adjacent to that property. Each enrolled property is depicted on the enclosed project area map (**Appendix I**). There are several non-enrolled properties, consisting primarily of platted residential subdivision lots, situated between Lake Ogletree and the Quarry which will not be affected by the SHA.

The Water Board owns Lake Ogletree and the property surrounding the lake, including both sides of Chewacla Creek downstream of the dam. The Water Board's enrolled property also includes a parcel abutting Chewacla Creek on the south side near the Moore's Mill Creek confluence. Chewacla State Park, which is owned by the State of Alabama and managed by the ADCNR, lies to the north of Chewacla Creek. The Harris, Pace, and Phillips enrolled properties each abut Chewacla Creek to the south across the Creek from Chewacla State Park. Under long term leases, Martin Marietta operates a limestone quarry on the Harris, Pace, and Phillips enrolled properties.

3.3 Biological Environment

Chewacla Creek downstream from Lake Ogletree provides habitat for a wide variety of aquatic species, where flowing water exists. The creek itself provides drinking water and foraging habitat for many terrestrial species. The forested buffer of land adjacent to the creek, along most of the enrolled properties, provides nesting/foraging habitat and cover for numerous migratory songbirds and other wildlife species.

Three species of unionid mussels in Chewacla Creek receive Federal protection under the Act. The southern clubshell mussel and ovate clubshell mussel were listed as endangered, and the fine-lined pocketbook mussel was listed as threatened on March 17, 1993 (Service, 1993). These mussel species are endemic to the Mobile River Basin and historically ranged widely in the Tallapoosa River drainage, including sites on the main stem and/or some of its larger tributaries, including Chewacla Creek. These mussels are intolerant of impoundment and are generally limited to high quality, stable gravel or gravel and sand substrates in flowing water (Hartfield and Jones, 1989; and Pierson, 1991). Habitat modification, sedimentation, and water quality degradation are considered the major threats to these listed mussels (Service, 1993).

Garner (2002) conducted a survey for freshwater mussels at the Water Board property downstream from Lake Ogletree Dam. Garner located and identified ten live fine-lined pocketbook individuals, but located no southern clubshell or ovate clubshell individuals.

However, based on the description of where these mussels were located it was unclear whether they were actually on Water Board property or on adjacent property, outside of the creek area covered by the SHA. Gangloff and Feminella (2003) conducted a new survey of the Water Board property to correctly determine the baseline population for this property. They found one live fine-lined pocketbook and no ovate or southern clubshell mussels within the Water Board property. Gangloff and Feminella (2003) describe the habitat within the Water Board property as “suboptimal”, except for the last 50 meters of stream reach closest to their downstream property boundary, due to a lack of sufficient flow for mussel reproduction.

Between the Water Board upstream property and the Harris property, Chewacla Creek flows adjacent to multiple properties, the landowners of which are not parties to the SHA. Populations of fine-lined pocketbook in Chewacla Creek in this area are described in Gangloff (2001). No southern clubshell or ovate clubshell mussels have been found within the proposed SHA area or between the Water Board upstream property and the Harris property, however populations are located downstream in Chewacla Creek (Hartfield, 2000). We believe that once flow is returned to the dry section of Chewacla Creek, these species will be able to naturally re-colonize this area.

4.0 ENVIRONMENTAL CONSEQUENCES

This section of the EA displays and discusses the impacts of each alternative on the physical, biological, and human related environmental aspects of the proposed actions

The primary direct effect of the proposal would be to rehydrate about 51,600 linear feet, almost ten miles, of the low flow channel immediately downstream of Lake Ogletree Dam to the vicinity of Martin Marrietta’s limestone quarry. A second primary benefit will be to reduce the movement of above ground streamflow to below ground through relatively recent “potholes.” (e.g., by fixing the subsidence features within the streambed). Discharges of no less than 2 MGD, and no less than 0.4 MGD under exceptional circumstances, will be maintained in the channel year-round. These discharge values are equivalent to about 3.1 cubic feet per second (cfs) and 0.6 cfs, respectively. Indirect and cumulative effects would be those changes strongly influenced by the proposed rehydration.

4.1 Environmental Consequences Common to All alternatives

Cumulative effects, as used in this National Environmental Policy Act analysis, are “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions (40 CFR § 1508.7).” The Service does not anticipate any measurable cumulative effects to occur whether or not the proposed action is implemented. No significant cumulative effects are expected under any of the alternatives considered. We broadly consider trends in environment, social, cultural, and economic resources, at a range of spatial and temporal scales, in our cumulative effects scoping analysis. In

particular, we considered the extent to which any of the alternatives would affect the sustainability, or cross a threshold, in the context of community and regional trends.

Essentially, nothing is expected to change outside of the low flow channel, whether a minimum flow in Chewacla Creek is established or not. Riparian vegetation is established and mature at the present time. Rehydrating the low flow channel during the dry season will not enhance the growth of that system. The lack of change in riparian vegetation indicates that the riparian ecosystem as a whole will not be affected, nor will flood stage elevation (changes in riparian vegetation can alter channel roughness, which is an important variable in flood stage).

No change in development trends and related demand for goods and services is anticipated, including house lot desirability, property values, or other social, economic, and demographic factors are expected whether or not the proposal is implemented. The Service anticipates that some minor additional recreational and aesthetic values may accrue to individuals if a minimum flow is restored. We have no evidence that this change will exceed a trivial threshold, and we emphasize that such values are subjective and individualistic.

The results of our scoping analysis of potentially significant cumulative effects is negative. No further analysis or description of this impact category is warranted.

4.1 Alternative 1, No Action Alternative

4.1.1 Water Quality

The no action alternative would not adversely affect, nor would it improve water quality in Chewacla Creek.

4.1.2 Wetlands and Waters of the U.S.

There are no wetlands on any portions of the enrolled properties which would be impacted by this alternative. There would be no impacts to waters of the U.S. from this alternative.

4.1.3 Wildlife Resources

There would be little or no benefit or impact to other fish and wildlife resources from this alternative.

4.1.4 Endangered Species

If the no action alternative is chosen there could be indirect impacts to the fine-lined pocketbook mussel population located between Lake Ogletree and the Pretty Hole if water quality in this section of the creek continues to decline due to lack of consistent flow.

4.1.5 Archeological and Historic Resources

No cultural resources would be impacted by the no action alternative

4.1.6 Social/Economic

No social or economic impacts or benefits would result from this alternative.

4.2 Alternative 2, Repair Subsidence Features Only

4.2.1 Water Quality

This alternative may result in minimal impacts to water quality through temporary increases in turbidity from subsidence feature repair. Water quality could improve slightly if repair of subsidence features alone allows water to continuously flow through the creek section which is currently dewatered.

4.2.2 Wetlands and Waters of the U.S.

There are no wetlands on any portions of the enrolled properties which would be impacted by project. Any of the proposed alternatives to restore Chewacla Creek, a water of the U.S., would require a permit from U.S. Army Corps of Engineers. A Nationwide Permit 27, #ALJ01-03342-K, was issued to Martin Marietta Aggregates on October 2, 2001, authorizing them to repair subsidence features and conduct stream restoration in order to restore flow in Chewacla Creek.

4.2.3 Wildlife Resources

There would be little or no benefit to other fish and wildlife resources associated with the repair of the subsidence features. Small areas of buffer habitat may be temporarily affected during repair of subsidence features.

4.2.4 Endangered Species

No impacts or benefits to the three listed mussels are expected to result from this alternative.

4.2.5 Archeological and Historic Resources

A cultural resource survey was conducted on April 29, 2002, by the Service's Southeast Region archaeologist. In his opinion, there will no impacts to cultural resources associated with this alternative.

4.2.6 Social/Economic

No social or economic impacts or benefits would result from this alternative.

4.3 Alternative 3, Pump Quarry Water upstream into Lake Ogletree Only

4.3.1 Water Quality

This alternative would increase flow in Chewacla Creek and, thus, should improve water quality downstream of Lake Ogletree.

4.3.2 Wetlands and Waters of the U.S.

There are no wetlands on any portions of the enrolled properties which would be impacted by project. Any of the proposed alternatives, except the no action alternative, to restore Chewacla Creek, a water of the U.S., would require a permit from U.S. Army Corps of Engineers. A Nationwide Permit 27, #ALJ01-03342-K, was issued to Martin Marietta Aggregates on October 2, 2001, authorizing them to conduct stream restoration in order to restore flow in Chewacla Creek.

4.3.3 Wildlife Resources

Aquatic species in Chewacla Creek would benefit from the increased flows between Lake Ogletree and the Pretty Hole in this alternative. Terrestrial species should also benefit if consistent flows are restored to the dewatered section. A small strip of forested upland habitat would be temporarily affected by the installation of water lines from the quarry, either into or downstream of Lake Ogletree.

4.3.4 Endangered Species

Implementation of this alternative would result in benefits to the fine-lined pocketbook mussel population located between Lake Ogletree and the Pretty Hole. While a portion of the minimum release may make it through the dewatered section of Chewacla Creek, a majority of the water would be lost into the subsidence features. The increased flow would benefit the fine-lined pocketbook mussels located immediately downstream of the dam, but little or no benefit would be gained for the three mussel species in the dewatered section.

4.3.5 Archeological and Historic Resources

A cultural resource survey was conducted on April 29, 2002, by the Service's Southeast Region archaeologist. He investigated several terraces along the creek which would be impacted by the installation of water lines from the quarry to, either into or downstream of, Lake Ogletree under this alternative. His subsurface investigations found that the terraces were created from spoil material. In his opinion, there will no impacts to cultural resources associated with this alternative.

4.3.6 Social/Economic

There would be no social/economic benefit or impact with this alternative.

4.4 Alternative 4, Repair Subsidence Features and Pump Quarry Water into Chewacla Creek Downstream of the Lake Ogletree Dam

4.4.1 Water Quality

This alternative would increase flow in Chewacla Creek and thus should improve water quality downstream of Lake Ogletree.

4.4.2 Wetlands and Waters of the U.S.

There are no wetlands on any portions of the enrolled properties which would be impacted by project. Any of the proposed alternatives, except the no action alternative, to restore Chewacla Creek, a water of the U.S., would require a permit from U.S. Army Corps of Engineers. A Nationwide Permit 27, #ALJ01-03342-K, was issued to Martin Marietta Aggregates on October 2, 2001, authorizing them to conduct stream restoration in order to restore flow in Chewacla Creek.

4.4.3 Wildlife Resources

Aquatic species in Chewacla Creek would benefit from the increased flows between Lake Ogletree and the Pretty Hole and downstream of the Pretty Hole in this alternative. Terrestrial species should also benefit if consistent flows are restored to the dewatered section. Small areas of buffer habitat may be temporarily affected during repair of subsidence features and a thin strip of forested upland habitat would be temporarily affected by the installation of water lines from the quarry to, either into or downstream of, Lake Ogletree.

4.4.4 Endangered Species

Implementation of this alternative would result in benefits to the fine-lined pocketbook mussel population located between Lake Ogletree and the Pretty Hole. All three mussels should benefit from increased and consistent flows in the section of Chewacla Creek which is currently dewatered.

4.4.5 Archeological and Historic Resources

A cultural resource survey was conducted on April 29, 2002, by the Service's Southeast Region archaeologist. He investigated several terraces along the creek which would be impacted by the installation of water lines from the quarry to, either into or downstream of, Lake Ogletree. His

subsurface investigations found that the terraces were created from spoil material. In his opinion, there will no impacts to cultural resources associated with any of the proposed alternatives.

4.4.6 Social/Economic

There would be no social/economic benefit or impact with this alternative.

4.5 Alternative 5, The Proposed Action (Repair Subsidence Features and Pump Quarry Water into Lake Ogletree with a Minimum Guaranteed Flow Released into Chewacla Creek)

4.5.1 Water Quality

The proposed action would require repair of subsidence features which may result in temporary impacts to water quality through increases in turbidity. Such repair actions would have to be permitted by the appropriate state agency with appropriate jurisdiction over protection of water quality (see 4.5.2 below). The increased flows in Chewacla Creek should improve water quality downstream of Lake Ogletree. The overall expected result of the conservation measures is a more natural flow in all sections of Chewacla Creek and an overall increase in the habitat available to the covered species. Consistent flow is expected to increase the opportunity for host fish to access the dewatered and upstream fine-lined pocketbook population. Under the conservation measures, year-round fish migration and increased interaction between the covered species and host fish will be possible. Increased fish migration from downstream of the intermittent section will also make it more likely that southern clubshell, *Pleurobema decisum*, and ovate clubshell, *Pleurobema perovatum*, will repopulate these sections.

4.5.2 Wetlands and Waters of the U.S.

There are no wetlands on any portions of the enrolled properties which would be impacted by project. Any of the proposed alternatives, except the no action alternative, to restore Chewacla Creek, a water of the U.S., would require a permit from U.S. Army Corps of Engineers. A Nationwide Permit 27, #ALJ01-03342-K, was issued to Martin Marietta Aggregates on October 2, 2001, authorizing them to conduct stream restoration in order to restore flow in Chewacla Creek.

4.5.3 Wildlife Resources

Aquatic species in Chewacla Creek would benefit from the increased flows associated with the proposed action. Terrestrial species should also benefit once consistent flows are restored to the dewatered section. Small areas of buffer habitat may be temporarily affected during repair of subsidence features and a thin strip of forested upland habitat would be temporarily affected by the installation of water lines from the quarry to, either into or downstream of Lake Ogletree.

4.5.4 Endangered Species

Implementation of the proposed action would result in benefits to the fine-lined pocketbook mussel population located between Lake Ogletree and the Pretty Hole. All three mussels are expected to benefit from increased and consistent flows in the section of Chewacla Creek which is currently dewatered.

4.5.5 Archeological and Historic Resources

A cultural resource survey was conducted on April 29, 2002, by the a Service archaeologist. He investigated terraces along the creek which would be impacted by the installation of water lines from the quarry to, either into or downstream of, Lake Ogletree under the preferred alternative. Subsurface investigations found that the terraces were created from spoil material. The conclusion reached was that there will be no impacts to cultural resources associated with any of the proposed alternatives.

4.5.6 Social/Economic

There would be no impacts to the area's economy from the proposed action. The City of Auburn and the Water Board could benefit from the preferred alternative by acquiring the use of the quarry's excess water. The additional water could delay the need to enlarge the current reservoir or construct an new reservoir, saving the city, and thereby the residents of Auburn, money.

4.6 Rationale for Selecting the Proposed Action

Both beneficial and adverse effects have been considered for the five project alternatives addressed above. The proposed action was selected over the other alternatives considered because it provides the greatest potential benefit to the three listed mussel species with minimal adverse environmental effects. The proposed action will provide benefits to aquatic species and water quality in Chewacla Creek.

The proposed action will not have a significant effect on, or pose any environmental risk to, the human environment; nor is it likely to be highly controversial. The proposed action will not affect historic or cultural resources or ecologically critical areas. The proposed action will not establish a precedent for future action. The proposed action is in compliance with all Federal, State, and local environmental laws.

Cumulative effects of the proposed action, along with past and foreseeable future actions, are analyzed above. No adverse cumulative effects are expected to result from the proposed action. In fact, implementation of the proposed conservation measures in the proposed action may reduce some of the adverse cumulative effects from other actions currently affecting this section of Chewacla Creek.

5.0 CUMULATIVE EFFECTS ANALYSIS

The Service consulted with the City, Water Board, and ADCNR to aid in our determination of past, current, and future actions which may occur adjacent to Chewacla Creek within the immediate project area, from Lake Ogletree Dam downstream to the downstream ADCNR/Phillips property boundary. Chewacla Creek is affected by other outside influences in the area of the enrolled properties. The cumulative effects of these influences contribute to the degradation of Chewacla Creek. Cumulative effects include past, present, and reasonable foreseeable future actions which effect the creek. Implementation of the proposed action should help to reduce the effects these impacts have on this section of Chewacla Creek.

Lake Ogletree dam was constructed on Chewacla Creek in the 1940s to provide a reliable drinking water source for the City of Auburn. The initial spillway elevation was 481.5 feet above mean sea level (msl); however, since 1991 the elevation has been raised to 486 feet msl. Lake Ogletree has not discharged a continuous flow into Chewacla Creek since its construction (Buss, 2001).

There are several platted subdivisions along the north side of Chewacla Creek between the dam and Chewacla State Park and two individual parcels on the south side between the lake and the Harris enrolled property. The subdivision lots which border the creek are either have single family homes or are vacant. The parcels on the south side of the creek were historically used for forestry or agriculture. These parcels are currently vacant and their future development potential is unknown. Minor recreational and residential impacts to the creek are associated with the parcels and subdivision lots (Richardson, 2001). There may also be minimal recreational effects along the creek on the Chewacla State Park property.

Martin Marietta Materials took over operation of a limestone quarry on the Harris, Pace, and Phillips enrolled properties in 1995; however, the quarry has been in constant operation since the early 1970s and construction aggregate has been produced at this site, off and on, since the 1920s (Buss, 2001). The quarry at this location has impacted the water quality of Chewacla Creek mainly through sedimentation from permitted effluent outfalls. These water quality impacts are considered minimal, and effects are absent a short distance downstream. Historic quarry operations coupled with the geology of the area may be factors in the development of sinkholes within the Creek and surrounding enrolled properties (Richardson, 2001). Although quarry operations are expected to continue at this location in the future, conservation measures outlined in the EA and SHA should reduce adverse effects to the creek.

Moore's Mill and Town Creeks both enter Chewacla Creek within the State Park enrolled property. Both creeks originate in the immediate Auburn area, a rapidly developing urban area. Sedimentation and non-point source pollutants from residential and commercial development impacts the water quality in these creeks, as well as Chewacla Creek (Webber and Blevins, 2000; Jones, 2001). Moore's Mill Creek is listed on ADEM's 303(d) list of impaired streams for

excess sedimentation (ADEM, 2002). Turbidity has been observed to be present in Chewacla Creek several miles downstream of the enrolled properties (Richardson, 2001).

6.0 LIST OF PREPARERS

This report was prepared by the U.S. Fish and Wildlife Service, Daphne, Alabama, Ecological Services Field Office.

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APPENDIX A - Safe Harbor Agreement

APPENDIX B - Alabama Historical Commission - Cultural Resources Letter

APPENDIX C - U.S. Army Corps of Engineers - Nationwide Permit Authorization

APPENDIX D - Alabama Department of Environmental Management - NPDES Permit

APPENDIX E - Jeff Garner - Comment Letter

APPENDIX F - Service Response to Jeff Garner Comment Letter

APPENDIX G - Environmental Defense - Comment Letter

APPENDIX H - Service Response to Environmental Defense Comment Letter

APPENDIX I - Project Area Map